Claims

1. An apparatus for forming a compound semiconductor substrate, the apparatus comprising:

a reacting chamber for forming a single crystalline film on a parent substrate;

a heating chamber connected to the reacting chamber within a processing channel, wherein the single crystalline film is separated from the parent substrate at a higher temperature than a room temperature; and

a supporter for supporting the single crystalline film and the parent substrate and maintaining the single crystalline film in a predetermined temperature.

2. The apparatus as recited in claim 1, wherein the apparatus is a hydride vapor phase epitaxy apparatus.

3. The apparatus as recited in claim 1, wherein the single crystalline film is a nitride.

4. The apparatus as recited in claim 1, wherein the predetermined temperature is in a range of 600 ℃ to 1000 ℃.

5. The apparatus as recited in claim 1 or 2, wherein the apparatus further comprises an exhausting chamber positioned between the reacting chamber and the heating chamber, and wherein each of reacting, exhausting and heating chambers is

isolated from each other by shutters.

6. A method for forming a compound semiconductor substrate, the method comprising the steps of:

a) preparing a parent substrate;

b) forming a single crystalline film on the parent substrate in a reacting chamber;

c) maintaining the single crystalline film in a predetermined temperature which is higher than a room temperature; and

d) illuminating laser beam on a backside of the parent substrate and separating the single crystalline film from the parent substrate.

7. The method as recited in claim 6, wherein the single crystalline film is a nitride.

8. The method as recited in claim 6, further comprising the steps of:

e) heating the parent substrate up to a predetermined temperature which is higher than a room temperature; and

f) moving onto a supporter the parent substrate on which the single crystalline film is formed, wherein the supporter is positioned in a heating chamber which is connected to the reacting chamber within a processing channel.

9. The method as recited in claim 6 to 8, wherein the

parent substrate is selected from one of sapphire (Al_2O_3), spinel ($MgAl_2O_4$) or silicon carbide (SiC) and the single crystalline film is a nitride.

10. The method as recited in claim 9, wherein the single crystalline film is formed by a hydride vapor phase epitaxy.

11. The method as recited in claim 9, wherein the step b) comprises the steps of:

a1) positioning a material selected from a group Ⅲ at a first temperature region of 600 ℃ to 900 ℃ in the reacting chamber and positioning the parent substrate at a second temperature region of 1000 ℃ to 1100 ℃ in the reacting chamber;

a2) injecting a nitrogen gas into the reacting chamber;

a3) injecting a hydrochloric acid gas into the reacting chamber; and

a4) injecting an ammonia gas into the reacting chamber.

12. The method as recited in claim 11, wherein the parent substrate is heated up to 600 ℃ to 1000 ℃.

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